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The epistemic and the counterfactual
interpretations of present perfect *pouvoir* in
French

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The contrast

Hacquard (2006):

Pouvoir in the present perfect ($a_{pres} p_{mod} u_{perfect}$):

- Epistemic interpretation

- (1) Il a pu prendre le train
He has can_{perfect} take the train
He might have taken the train

The contrast

- Implicative interpretation

(2) Il a pu prendre le train

He has can_{perfect} take the train

He could the train

Actuality entailment: he took the train

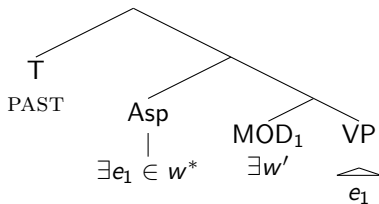
Hacquard (2006,2009,2010)

The merit of Hacquard (2006,2009,2010) is to present a theory of the systematic ambiguity of the modal that, in her work, is solved as syntactic scope ambiguity.

Available works that do not address the question of the polysemy: Mari and Martin (2007); Demirdache, H. et Uribe-Etxebarria, M. (2008); Laca (2008); Mari and Schweitzer (2010); Homer (2010a,b); Mari (2011); Piñón, C. (2011).

Implicative interpretation

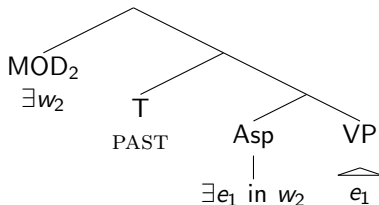
PAST > MOD.



PAST determines the time of the modal evaluation. Event variable closed at PAST, i.e. outside the modal. AE arises.

Epistemic interpretation

MOD > PAST.



PAST determines the time of the eventuality and not the time of the conjecture.

Major advantage

Hacquard, 2006: 26, ex. 20

- (3) Jean a très bien pu prendre le train
*Based on what I know (now), he might have taken the train
(in the past)*

Present evidence is used; if the modal is evaluated in the past, mismatch; hence the time of the modal evaluation is the speech time (hence movement).

No movement: questions, questions, questions, ...

Without movement: modal is interpreted in the past, but epistemic alternatives are projected at the utterance time.

The modal evaluated in the past is **not epistemic** (i.e. #given the evidence I had then ...)

→ **Question:** How open past alternatives and present uncertainty relate to each other ?

Anticipating ... on the spirit of the solution

→ Mari and Schweitzer (2010): rely on inferential mechanisms (**reasoning forward** from past alternatives to epistemic uncertainty).

◇ p in the past allow to infer that both p or $\neg p$ are available alternatives in the present. Since the speaker is in a state of epistemic uncertainty in the present, both p and $\neg p$ are considered viable alternatives.

The question: *how are past metaphysical alternatives reconstructed given present uncertainty ? Reasoning backward*

Major problem for the whole enterprise of Hacquard (2006,2009): the third interpretation

- ▶ Empirical: Mari and Martin (2007) first identify a root (that they call abilitative), non-implicative reading.

(4) Ce robot a pu repasser les chemises à un stade bien précis de son développement, mais cette fonction n'a jamais été utilisée.

The robot could have ironed skirts at a precise stage of its development, but this function has never been used.

Goal (I): explain the three-fold ambiguity

A unified theory for the three-fold ambiguity :

- (5)
- a. **Root, Implicative.** Jean a pu déplacer la table,
#mais il ne l'a pas fait.
John could move the table, #but he did not do it.
 - b. **Epistemic.** John a pu prendre le train (comme il a pu
ne pas le prendre)
*John might have taken the train (but he might not
have taken it)*
 - c. **Root, non-implicative.** Ce robot a pu repasser les
chemises à un stade bien précis de son développement,
mais cette fonction n'a jamais été utilisée.
*The robot could have ironed skirts at a precise stage of
its development, but this function has never been used.*

Goal (II): competition with past conditional

Speakers reports judgements that highlight a competition between the non-implicative reading of a *pu*-sentences and *aurait pu*-sentences (modal in the past conditional):

- (6) Ce robot **aurait pu** repasser les chemises à un stade bien précis de son développement, mais cette fonction n'a jamais été utilisée.

This robot could have ironed skirts at a precise stage of its development, but this function has never been used.

↪ **Why?**

Goal (III): explain discursive properties

- (7) Qu'est-ce qu'il a fait Jean dans ce bureau ?
Il a déplacé un meuble
Il a pu déplacer une table

What did John do in this office ?
He moved a table
#He could move a table

Goal (III): explain discursive properties (continued)

Same property observed for other operators (VERUM operator, Gutzman and Castrovejo-Miro, Mari for the French future 2013)

- (8) Qu'est-ce qu'il a fait Jean dans ce bureau ?
#Il a DÉPLACÉ un meuble
Il a déplacé une table

What did John do in this office ?

#He MOVED a table

He moved a table

Gutzman and Castrovejo-Miro solution: assert p and downdate $?p$.

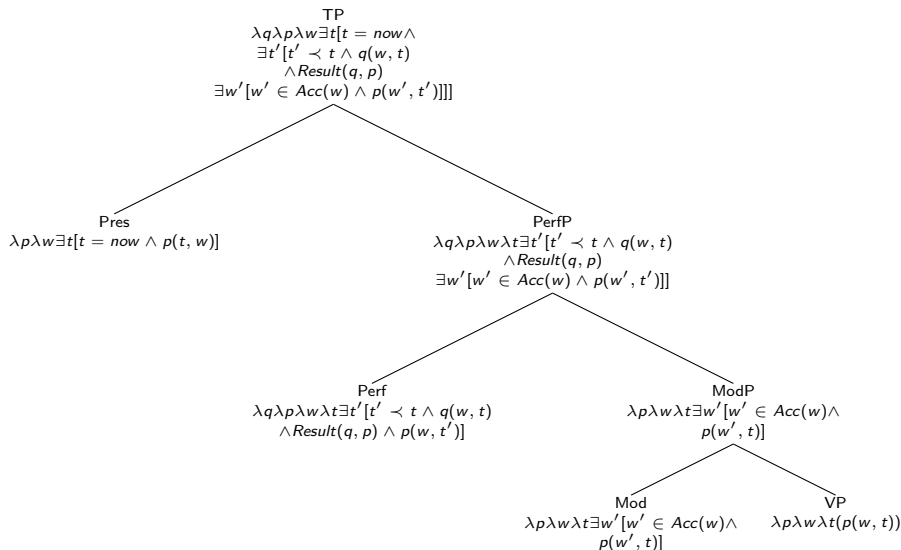
Overview

New semantic / pragmatic theory:

- ▶ The **meaning**:
 - ▶ There is an underspecified semantic rule of interpretation of *pu*-sentences, in which all the operators are interpreted *in situ*.
 - ▶ The present perfect is analyzed as a combination of present + perfect, hence as providing a **result state** (see Schaden, 2009).
- ▶ The **interpretations**:
 - ▶ The present perfect has an **abductive-inferential** use that exploit knowledge of the result state.
 - ▶ The variety of interpretations depends on what the speaker knows, compatibly with the semantics.

Model-theoretic side: branching time framework (Thomason, 1984; Condoravdi, 2002; Mari, 2013).

Composition



Composition

VP: provides a proposition; its truth is relativized to worlds and times.

ModP: provides a possible world in which p is true.

Perfect:

- Perfect treated as operator over properties of events (e.g. de Swart, 2007; Schaden, 2009). It locates the event at a past time w.r.t. a reference time (which can be present, past or future) and provides a result event.

- Here, we treat it as a propositional operator.

Perf: provides a past time at which p is true (in possible world w') and provides a result proposition, which is true at a time t in world w .

Pres provides the now. Proposition q (the result proposition) is true at *now* in world w .

\hookrightarrow p is true in a possible world w' (accessible from w) at a past time t' (for short $\diamond p(t')$); the result proposition q is true at *now* in world w .

The q world

'Result' event-related notion, we use it here improperly for propositions.

(9) Let $t', t \in T$, $t' \prec t$:

$$\text{Result}(p, q) = 1 \text{ iff } \forall w' \in W(p(w', t') \rightarrow q(w', t))$$

- If q is the result of p , then all worlds in which p is true are worlds in which q is true.
- p is evaluated at a time that precedes the time of evaluation of q .

Decidedness

The key notion is (non)-decidedness defined in a branching time framework, Mari, 2013.
and the relations between epistemic and metaphysical (un-)decidedness, evaluated at different times.

Branching time: basics

We employ a $W \times T$ forward-branching structure (Thomason, 1984). A three-place relation \simeq on $T \times W \times W$ is defined such that (i) for all $t \in T$, \simeq_t is an equivalence relation; (ii) for any $w, w' \in W$ and $t, t' \in T$, if $w' \simeq_{t'} w$ and t precedes t' , then $w' \simeq_t w$ (we use the symbols \prec and \succ for temporal precedence and succession, respectively).

In words: $w' \simeq_{t'} w$: w and w' are historical alternatives (i.e. are identical) at least up to t' and thus differ only, if at all, in what is future to t' .

Branching time: basics

Assume two worlds w' and w in W and two times t', t'' in T such that $t' \prec t''$. In both partial models in Figure 1, w' and w are equal up to and including t' (Thomason, 1984). Worlds that stand in the equivalence relation $\simeq_{t'}$ need not branch at t' ; they can branch at a time after t' (e.g., t'' in Figure 1b).

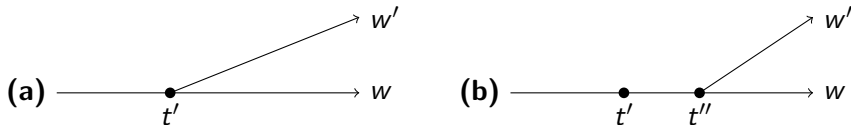


Figure: $w \simeq_{t'} w'$

Branching time: common ground

For any time $t \in T$, we define the *common ground* $cg(t)$ as the set of worlds that are identical to the actual world w_0 at least up to and including t .

$$(10) \quad cg(t) := \{w \mid w \simeq_t w_0\}$$

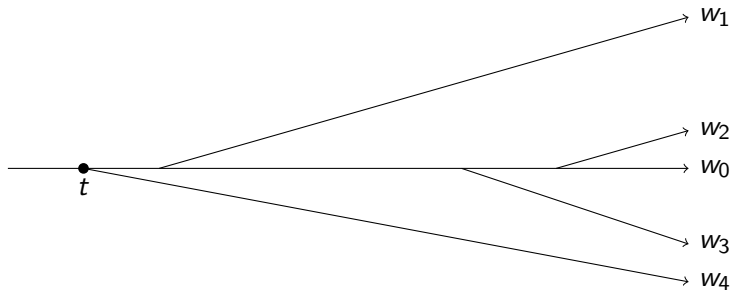


Figure: $cg(t)$

Branching time: reasonable futures

- (11) $\text{ReasFut}(t) :=$
 $\{w_i \in cg(t) \mid w_i \text{ is such that the set of rules fixed at } t$
 $\text{continue to hold in } w_i\}$
- (12) $\text{ReasFut}(t) = \{w_1, w_2, w_0, w_4\}$

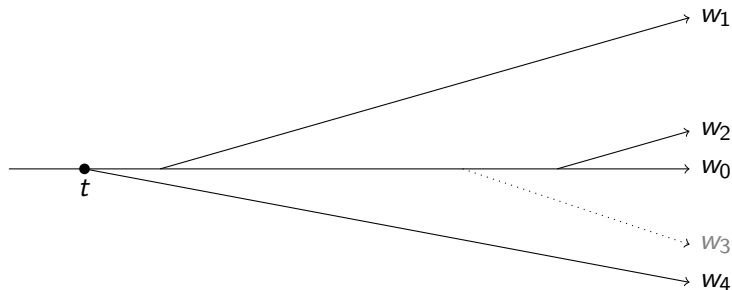


Figure: Reasonable Future Worlds (ReasFut)

Branching time: (un)decidedness

- ▶ The actual world exists only until the utterance time.
- ▶ The actual world is metaphysically **decided** until and including the utterance time.

Condoravdi, 2002; Mari, 2013:

- ▶ **Epistemic interpretation**: is compatible with metaphysical decidedness (options can be metaphysically closed but epistemically open).
- ▶ **Metaphysical interpretation**: is available with metaphysical un-decidedness.
→ Given a branching point t , the actual-world-to-be at t is metaphysically undecided at t .

Representing the semantics in the reasonable-future branching framework

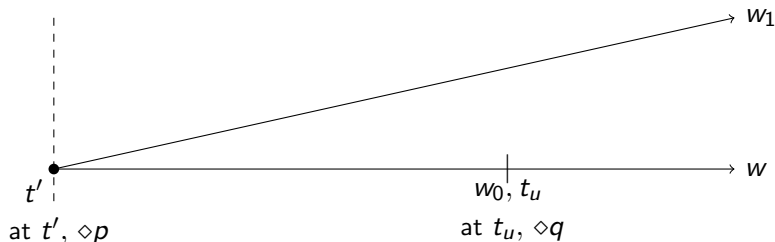


Figure: Semantics

- $\Diamond q$ is true at t_u : w_0 decided at t_u . $\Diamond q(t_u)$: **epistemic** alternatives ($q, \neg q$).
- Since $\Diamond p$ is true at t' which is a branching point, $\Diamond p(t')$ has a **metaphysical** interpretation. p and $\neg p$ are metaphysical alternatives.

The inferential use of the present perfect

Present perfect across languages has an inferential use. (see among many others: Comrie, 1976; Apotheloz and Nowakowska, 2010 for French and Polish, DeLancey, 2001 for Bulgarian).

Various typologies for the 'inferential use': illative, abductive, explicative, based on direct/direct evidence

Apotheloz and Nowakowska (2010) identify an inferential-abductive use of the present perfect: (free translation, A&N, *ibid.*:4): from a present result state one can infer a past event that has produced this state.

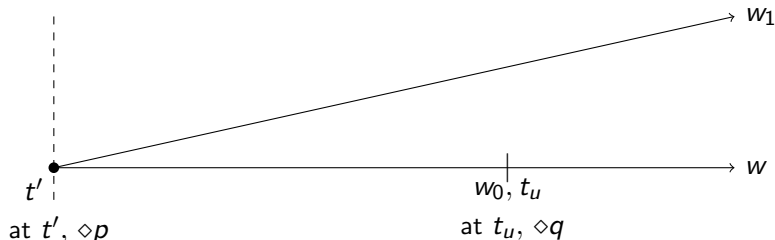
↪ We exploit here the inferential-abductive use of the present perfect. I will use the term inferential for short.

The inferential use of *pouvoir* in the present perfect

- Result state $\Diamond q(t_u)$
- Knowledge supporting $\Diamond q(t_u)$
- But also ... Knowledge **compatible** with $\Diamond q(t_u)$:
 - ▶ $\Diamond q(t_u) \wedge q(t_u)$
 - ▶ $\Diamond q(t_u) \wedge \neg q(t_u)$

Epistemic in picture

Semantics:



Pragmatics: at t_u knowledge compatible with $\Diamond q(t_u)$; infer $\Diamond p(t')$.

- $\Diamond q$ is true at t_u : w_0 decided at t_u . $\Diamond q(t_u)$: **epistemic** alternatives.
- Since $\Diamond p$ is true at t' which is a branching point, $\Diamond p(t')$ has a **metaphysical** interpretation.

Epistemic: example

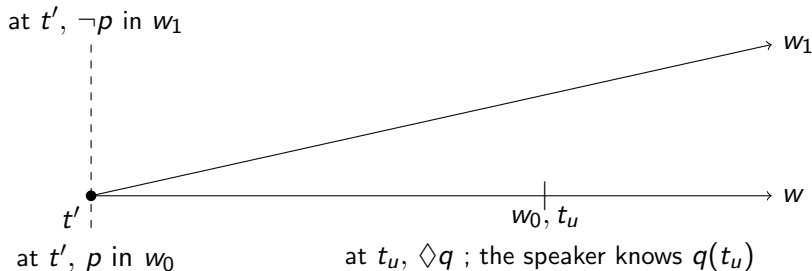
- (13) Le voleur a très bien pu rentrer par la fenêtre
The thief might have entered through the window

- My parents never close the windows; knowledge compatible with the thief having passed (result state) through the window ($\Diamond q(t_u)$):
 - Present settledness (the thief passed through the window or did not pass through the window).
 - Both plausible, given what I know.
 - The thief passing through the window or not passing through the window were available continuations of the actual world at the branching point.
- Backward (i.e. abductive) Inference: it was undecided at the branching point whether the actual-world-to-be was such that the thief would pass through the window or not.
 - Given what I know, there were metaphysical alternatives such that p and $\neg p$ were both possible continuations of w_0 at t' , the branching point.

Implicative in picture

Semantics: as above.

Pragmatics:



Know at t_u : $q(t_u)$; infer $p(t')$ is true in w_0 . Implies that $\neg p(t')$ is true in w' . Counterfactual interpretation: knows that p but knows that the actual world could have evolved in a way such that $\neg p$.

Implicative reading: deriving the AE

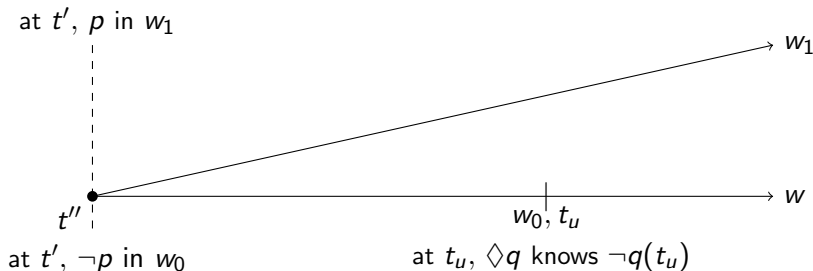
- (14) Il a pu prendre le train
He managed to take the train

- *Know*: $q(t_u)$; *Infer* $p(t')$.
- Ex. John is on the train $q(t_u)$; Abductive inference: $p(t')$: he took the train. No actuality entailment.
- Knowledge that q and hence that p , in the context of utterance.
BUT:
- **Asserts**: $\Diamond p(t')$ (**is the speaker being informative ?**): since he knows $q(t_u)$ he knows $p(t')$. Why does he choose to use the modal ?
- $\neg p(t')$ true in a possible continuation of the actual world at t' .
 \hookrightarrow Counterfactual use. He took the train, but the actual world could have evolved in a way such that $\neg p$.
 \hookrightarrow And also Abilitative flavor (see Belnap, 1991).

Root non-Implicative in picture

Semantics: as above.

Pragmatics:



Know at t_u : $\neg q(t_u)$; infer $\neg p(t')$ is true in w_0 .

Hence conveys that $p(t')$ is true in w' , branching from w_0 .

Counterfactual interpretation: knows that $\neg p$ but knows that the actual world could have evolved in a way such that p .

Root non-Implicative

- (15) Il a pu s'échapper à ce moment là, mais il ne s'est pas échappé
He could escape at that moment, but he did not escape

- *Know* $\neg q(t_u)$; *Infer* $\neg p(t')$.
- Asserts: $\Diamond p(t')$ (is the speaker being informative?): $p(t')$ true in a metaphysical alternative at t' .
 - \hookrightarrow Counterfactuality.
 - \hookrightarrow 'Occasion': at the time of the branching, the actual world could have evolved in such a way that he escaped.

Chess player 1

Scenario: John could have won at move 39, but he misses the chance.

(16) Il a pu / aurait pu gagner à ce moment là, #mais il a perdu sa chance

He could have won at that precise moment, #but he missed his chance

Same analysis for both (knowledge that $\neg p$ at t_u , and opening up of the alternatives at the past time t') !

Strong set of constraint: present knowledge + constraint on identity of worlds up to t' (à la Condoravdi, 2002).

Chess player 2

Scenario: John never played the game which is under discussion.

(17) Il #a pu / aurait pu gagner, s'il avait joué
He could have won, if he played

No constraint on identity (à la Abush, 2012).

Preference for the past conditional

- In general: the preferred form is the one that conveys specific information. We would have expected complementary distribution.
- However, for now (possible evolution ? See Spanish), the conditions on the use of present perfect *pouvoir* seem too constraining and require very precise knowledge.
- In particular, present perfect *pouvoir* cannot be used when the adverb denoting a bounded period of time are absent, *providing the branching time*.
↪ Preference for the conditional as it requires only taking into account a certain body of evidence and poses no constraints on branching points.

In discourse

- (18) What did John do ?
(#) Il a pu déplacer la table
He could move the table

The theory: the speaker conveys that (i) John moved the table and (ii) it was not taken for granted.

Without previous expectation/doubt of the hearer, the speaker is being too informative.

- If previous expectation is presupposed (*What did John do, finally?*), then the sentence is felicitous.

Conclusion

Main features of the semantic-pragmatic theory:

- ▶ Operators in situ.
- ▶ Result state of the present perfect.
- ▶ Inferential use of the present perfect.
- ▶ Knowledge of/compatible with the result state.

Main results:

- ▶ Explain in a unified way the three available interpretations of *a pu*-sentences.
- ▶ Explain why there is a competition between the non-implicative reading and the counterfactual.
- ▶ Explain in a principled way how indirect evidence at the utterance time and metaphysical alternatives relate to each other.
- ▶ Explain the behavior of implicative *a pu* sentences in discourse.

Thank you !

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